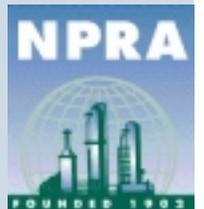


NPRA

Non-road Diesel Presentation

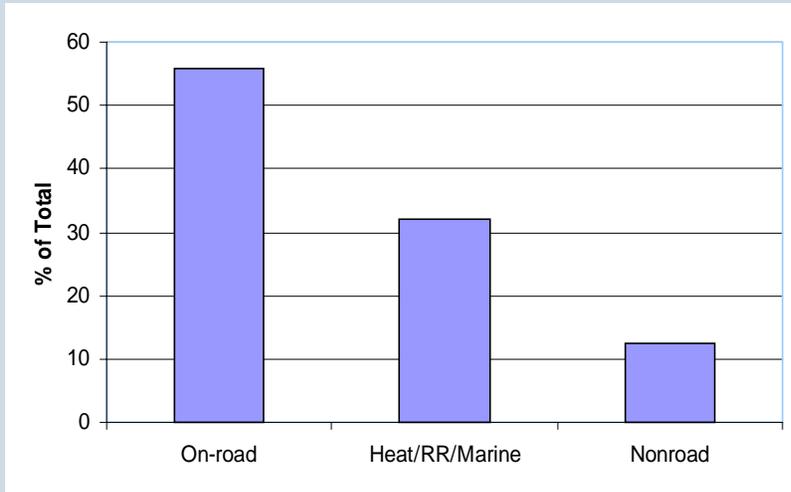
MSTRS Non-road Working Group November 29, 2000



Size of the Non-road Diesel Market

	<u>Billion gallons</u>
On Highway	32.1
Non-road	7.1
Res/Ind/Com	12.8
Railroad	3.2
Marine	<u>2.4</u>
Total	57.6

- ◆ Currently two grades of diesel fuel to serve all markets/customers
- ◆ Non-road includes farm, military, mining, construction, and electric utility
- ◆ Res/Ind/Com is primarily heating oil
- ◆ Non-road is 12% of total diesel pool
- ◆ By comparison, gasoline in 1999 was 129 billion gallons
- ◆ Non-road diesel fuel could “disappear” in some regions if new requirements are imposed since it is a small volume fuel.



Source: EIA,
Fuel Oil and Kerosene Sales 1999, DOE/EIA-0535(99), Sept 2000

Characteristics of the Non-road Diesel Fuel Market

- ◆ **Variety of different end uses and users of distillate fuels including:**
 - **railroad**
 - **home heating oil**
 - **stationary diesel engines**
 - **marine**
 - **mining**
 - **construction**
 - **agriculture**
 - **jet fuel**
- ◆ **A change in non-road diesel sulfur would affect many other users and market segments.**

Characteristics of the Non-road Diesel Fuel Market

- ◆ These users have differing priorities and issues.
- ◆ A change in diesel requirements for one segment may have unintended consequences for another distillate segment. A change in non-road diesel fuel sulfur would affect other distillate markets:
 - jet fuel
 - home heating oil
 - railroad
 - marine
- ◆ Need to be especially sensitive to the likely effect on home heating oil availability and price.

Diesel Fuel Supply

- ◆ Environmental regulations can have an effect on fuel supply.
- ◆ Individual refiners may choose to exit a market, which may lead to tight supplies in some areas.
 - Additional operating costs
 - Lack of capital for new facilities
 - Loss in operating flexibility
- ◆ Some refiners will have alternative markets for diesel fuel.
 - home heating oil
 - export markets
 - conversion to other products

State of the Petroleum Refining Industry

- ◆ Industry is planning to invest \$19 billion for :
 - gasoline desulfurization
 - on-road diesel fuel desulfurization
- ◆ Industry faces additional costs due to MTBE phase down.
- ◆ Industry faces additional costs and investment due to the toxics rule.
- ◆ There is likely to be a significant overlap in the implementation periods for gasoline and on-road diesel fuel which will strain the industry's ability to build/revamp facilities.
 - Shortage of resources in the Engineering and Construction industry.
 - Shortage of resources among suppliers of specialized equipment.
- ◆ These challenges are described in more detail in the National Petroleum Council's July 2000 report for DOE.

Refinery and Distribution Infrastructure Issues

- ◆ **Non-road, railroad, marine fuels and home heating oil are currently interchangeable. New non-road diesel fuel requirements:**
 - **reduce refining and distribution system flexibility**
 - **require additional tankage in refineries and terminals which are usually configured for two or three fuels**
 - **make local supply shortages more difficult to cope with**
- ◆ **The costs and technical challenges of reducing non-road diesel's sulfur content are not the same as for on-road diesel fuel:**
 - **Blendstocks used for non-road fuels are different than for on-road.**
 - **Most non-road diesel and home heating oil blendstocks are not currently hydrotreated.**
 - **Blendstocks for non-road diesel are harder to desulfurize than for on-road diesel blendstocks**

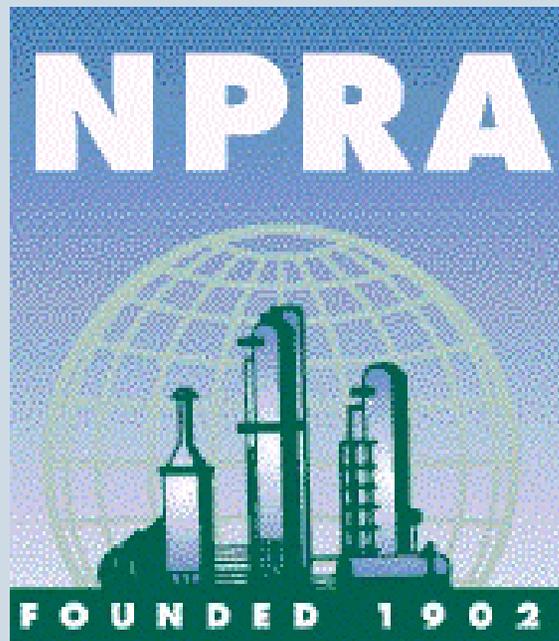
Emission Controls for Non-road Diesel Engines

- ◆ Exhaust emission control strategies for non-road applications are undefined.
 - Can't assume a direct technology transfer from on-road to non-road applications.
 - Non-road engines' operating conditions and use severity are usually very different from those of on-road engines.
- ◆ The engine, fuel, and aftertreatment equipment should be treated as a system and optimized to maximize cost effectiveness.
- ◆ Other emission control strategies should be considered. These might include:
 - idling limits
 - inspection and maintenance programs
 - engine/aftertreatment retrofits

Summary

◆ Timing

- Capital and engineering/construction challenges due to gasoline/diesel overlap should dictate that diesel fuel(s) changes are delayed.
 - Examine the refining synergies for producing ULSD and non-road diesel fuel (if non-road changes) and then decide best implementation schedule for ULSD and non-road diesel fuels.
- ◆ Evaluate the applicability of present on-road emission control technology in non-road applications.
 - ◆ Changing non-road diesel will affect other distillate fuels. We need to understand these issues.
 - ◆ New requirements for non-road fuel may squeeze supplies in some regions. For example, rural areas, farmers, small refiners, or isolated product markets could be significantly affected.



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